



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,562	08/26/2003	Gavin P. Towler	108165	5155
23490	7590	10/03/2006	EXAMINER	
HONEY WELL INTELLECTUAL PROPERTY INC PATENT SERVICES 101 COLUMBIA DRIVE P O BOX 2245 MAIL STOP AB/2B MORRISTOWN, NJ 07962			ECHELMAYER, ALIX ELIZABETH	
		ART UNIT	PAPER NUMBER	
		1745		
DATE MAILED: 10/03/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,562	TOWLER ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 August 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 13-35 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 08 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>8-26-03</u> .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I in the reply filed on July 31, 2006 is acknowledged. The traversal is on the grounds that the reasons for restriction are not valid, and that Group I and Group II were separated improperly. The examiner believes that the groups are proper, but that the reasons are not valid.

Alternate reasons for restriction are given below:

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-12, drawn to a fuel cartridge for storing and generating hydrogen, classified in class 422, subclass 239.
- II. Claims 13-22, drawn to a solid fuel cartridge for use in a fuel cell, classified in class 429, subclass 19.
- III. Claims 23-32, drawn to an apparatus for holding a fuel cartridge for a fuel cell, classified in class 422, subclass 187.
- IV. Claims 33-35, drawn to a fuel cell system, classified in class 429, subclass 34.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination I has separate utility such as

Art Unit: 1745

in a fuel cell that does not require that the hydrogen outlet be sealed or unsealed. Invention II, in claim 13, requires that the hydrogen outlet be unsealable, while Invention I makes no mention of sealing any part of the housing. Further, Invention II details how the sealing means for one container be used in another container, requiring that a plurality of containers be part of the invention, but, again, Invention I does not require sealing means. Additionally, Invention II does not require many of the particulars of Invention I, such as the two compartment system. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

4. Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination I has separate utility such as in a different housing. The slidable door of Invention III is not required for the cartridge of Invention II to generate hydrogen. See MPEP § 806.05(d).

Art Unit: 1745

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

5. Inventions I and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination I has separate utility such as in another application where hydrogen is needed. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to

Art Unit: 1745

provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

6. Inventions II are III related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as in a housing that does not have doors, since Invention II already has a sealing and unsealing means. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

7. Inventions II are IV related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as another system that requires hydrogen. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together.

Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

8. Inventions III are IV related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination III has separate utility such as in another system where hydrogen is needed. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to

provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

9. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

10. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

11. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

12. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

13. The drawings filed March 8, 2006 are accepted by the examiner.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-4 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Bloomfield et al. (US Patent 3,649,360).

Bloomfield et al. teach a hydrogen generation system for a fuel cell.

Regarding claim 1, the hydrogen generation system includes a hydride and a water reservoir. Water from the reservoir reacts with the hydride to produce hydrogen. A wick attaches the reservoir to the hydride bed. Variations in the pressure in the hydride bed influence the amount of water that travels through the wick to the bed (column 2 lines 18-39).

As for claims 2 and 3, Bloomfield et al. teach that the metallic hydride may be calcium hydride, lithium hydride, magnesium hydride, sodium hydride, or potassium hydride (column 2 lines 71-72; column 3 lines 1).

With regard to claim 4, as discussed above, water is used to react with the hydride to generate hydrogen.

As for claim 10, for the wicking system to work, the water reservoir must be under pressure.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 5, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al. in view of Hockaday et al. (US Patent 6,544,400).

The teachings of Bloomfield et al. as discussed above are incorporated herein.

Bloomfield et al. teach a hydrogen generation system for a fuel cell. Bloomfield et al. further teach that a membrane impermeable to water can be used to isolate components of the system (column 4 lines 39-42).

Bloomfield et al. fail to teach that the membrane can be used during operation to allow passage of hydrogen gas but not water.

Hockaday et al. teach a portable hydrogen generation system. The system has two chambers: one with the fuel and the second that contains moisture or water vapor. The fuel passes through a membrane to the moist chamber, where it forms hydrogen (column 12 lines 39-67; column 13 lines 1-7).

Regarding claim 5, the generated hydrogen gas passes through an elastic, hydrophobic membrane before being delivered to the fuel cell (column 12 lines 57-66). The membrane prevents the contamination of the fuel cell anode by water but still allows hydrogen fuel to the fuel cell.

With regard to claim 11, Hockaday et al. teach a bladder for pressurizing the reactant chambers of the system (column 9 lines 62-67).

As for claim 12, Hockaday et al. further teach a flexible diaphragm containing the membrane (column 13 lines 1-2).

Hockaday et al. teach that this feedback mechanism, the combination of the membrane, diaphragm and bladder, allows the generating system to automatically maintain constant pressure or a constant flow rate of hydrogen (column 3 lines 62-64).

It would be desirable to one having ordinary skill in the art to provide a hydrophobic membrane for the hydrogen supply to the fuel cell in order to prevent poisoning of the fuel cell. It would also be desirable to one having ordinary skill in the art to use a flexible diaphragm in combination with the hydrophobic membrane to control the transfer of hydrogen to the anode.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the membrane, bladder and diaphragm of Hockaday et al. in the hydrogen generation system of Bloomfield et al. in order to prevent water or water vapor from entering the fuel cell and to better control the delivery of hydrogen to the fuel cell.

Art Unit: 1745

18. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloomfield et al. in view of Gelsey (US Patent 7,108,933).

The teachings of Bloomfield et al. as discussed above are incorporated herein.

Bloomfield et al. teach a two-compartment hydrogen generation system for a fuel cell, in which the first and second compartments are separated by a wick. The wick allows transfer of water from the second compartment to the first, where it reacts with a solid metal hydride to produce hydrogen.

Bloomfield et al. fail to teach that a valve can be used to control the flow of liquid from the second compartment to the first.

Gelsey teaches a hydrogen storage system for storing hydrogen for use in a fuel cell. The system may contain valves, covers, microcontrollers, etc. to control the generation of hydrogen (column 6 lines 18-24). For example, valves may be opened or closed to regulate the amount of water or water vapor that is exposed to a metal hydride (column 5 lines 49-57).

Gelsey further teaches that the control systems make possible the control of power generation, for example when the fuel cell generates power and when it does not, by controlling the delivery of hydrogen fuel (column 5 lines 24-31).

It would be desirable to use the control mechanisms of Gelsey, such as the valve and the microcontrollers to control the valve, in the system of Bloomfield et al. in order to control the power output of the fuel cell.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the valves and microprocessors of Gelsey in the

Art Unit: 1745

hydrogen generator of Bloomfield et al. in order to control the power output of the fuel cell.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prasad et al. (US Pre-Grant Publication 2003/0194369) and Taschek (US Patent 4,155,712).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SUSY TSANG-FOSTER
PRIMARY EXAMINER

